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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/766,414 | 01/27/2004 | Thomas M. Myrick | HNY-P14 | 4154 |

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| EXAMINER |
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STEPHENSON, DANIEL P

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| ART UNIT | PAPER NUMBER |
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3672

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|---|--------------------------------------|--|
| Office Action Summary | Application No. 10/766,414 | Applicant(s) MYRICK ET AL. | |
| | Examiner Daniel P. Stephenson | Art Unit 3672 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,12-17 and 19-24 is/are rejected.
- 7) ☒ Claim(s) 2,7-11 and 18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

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DETAILED ACTION

Response to Amendment

1. The substitute specification filed 8/10/04 has been entered.

Specification

2. The disclosure is objected to because of the following informalities: there is a blank where the contract number for the research funding is located.

Appropriate correction is required.

Claim Objections

3. Claims 1, 19 and 24 are objected to because of the following informalities: they use quotation marks around the terms "feet" and "snowshoe". These quotation marks are unnecessary and should be removed. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3-6, 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Newman et al. in view of Graham. Newman et al. (Fig. 1 and 8) discloses a subsurface drilling device for drilling in a borehole. It has a pair of spaced-apart forward and rearward feet sections (15) coupled by an axial thruster mechanism between them that can expand and contract along a main axis of the device. This allows the feet sections to grip the borehole wall and alternately move the forward feet section forward and pull up the reward feet section using an inchworm

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method of mobility. There is a front drill section having a drill head (1) for cutting into the borehole and conveying cuttings along the main axis of the device. The axial thruster mechanism is composed of tandem sets of thrusters. One of the thruster sets being used to advance the front drill section, and the other thruster set being used to advance the forward feet and to contract the rearward feet section forward. The tandem sets of thrusters allow both feet sections to be locked onto the borehole wall while the front drill section is being extended for drilling. There is a central spine tube (2). All the elements of the apparatus are fixed to this tube. It is arranged to convey cuttings from the front drill section to a cutting depository. There is a steering mechanism (21) provided with said rearward feet section to allow small corrections to the drilling direction to be made as drilling commences. Power is supplied to the device from a unit onboard the device.

Newman et al. does not disclose that there is an on-board depository for collecting the cuttings. Graham discloses a drilling mechanism in which there is a depository for cuttings located on the central axis of the mechanism. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a depository as shown in Graham with the device of Newman et al. This would be done so that the cuttings could be retained for later analysis as taught by Graham.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Newman et al. in view of Graham as applied to claim 12 above, and further in view of Harrison. Newman et al. in view of Graham shows all the limitations of the claimed invention, except it does not disclose that the steering mechanism is comprised of an inner and outer eccentric ring that provide misalignment between the center spine and the rear feet. Harrison (Fig. 4A, 4B, 5A and 5B)

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discloses a steering system in which there are a number of eccentric rings that allow for deviation from a straight line in order to correctively steer an apparatus. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the ring steering of Harrison with the apparatus of Newman et al. in view of Graham. This would be done because it allow for variation on the direction without adjusting other major elements of the propulsion.

7. Claims 14, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Newman et al. in view of Graham as applied to claim 1 above, and further in view of Scott et al. Newman et al. in view of Graham shows all the limitations of the claimed invention, except it does not disclose that the power is supplied to the device through the use of a tether connected to a supply source on the ground surface, or that the tether is connected to a reel. Nor does it disclose that there is a science instrumentation section carried on board the device. Scott et al. discloses a ground drilling machine in which the power to drive the machine is supplied through a tether attached to a power source. Tensioning the tether in combination with drilling can raise the drilling device. There is a science instrumentation section (37) located at the front of the device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the tether and sensors of Scott et al. with the apparatus of Newman et al. in view of Graham. This would be done to provide an alternative to having the power source on the apparatus and to allow for downhole measurements.

With regards to the limitation of having a spool on the surface for the tether, it is Officially Noticed that a spool is a common mechanism for providing tension for raising material from a lower position. Therefore, it would have been obvious to one of ordinary skill in the art

at the time the invention was made to use a spool on the surface in association with the apparatus of Newman et al. in view of Graham and Scott et al.

8. Claims 19-22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott et al. in view of De Smaele. Scott et al. discloses an autonomous subsurface drilling device for drilling in borehole. It has forward and rearward drill sections for drilling into material in the borehole in forward and rearward directions, whereby the device can maneuver in either direction underground. Power can either be supplied to said device through a power cord tether connected to a supply source on the surface of the ground, or through power supplies onboard the drill. Scott et al. does not disclose a pair of spaced-apart forward and rearward feet sections coupled by an axial thruster mechanism between them that can expand and contract along a main axis of the device to allow the feet sections to grip the borehole wall and alternately move the forward feet section forward and pull up the rearward feet section using an inchworm method of mobility. Nor does it disclose that the feet are "snowshoe" feet. De Smaele discloses (Fig. 18A-18F) a drill with a pair of spaced-apart forward (28) and rearward feet (125), broadly read as being large enough to be considered "snowshoe" feet, sections coupled by an axial thruster mechanism between them that can expand and contract along a main axis of the device to allow the feet sections to grip the borehole wall and alternately move the forward feet section forward and pull up the rearward feet section using an inchworm method of mobility. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the driving force of De Smaele with the apparatus of Scott et al. This would be done to provide greater thrust at the drill head for Scott et al.

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9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scott et al. in view of De Smaele as applied to claim 19 above, and further in view of Mount, II. Scott et al. in view of De Smaele shows all the limitations of the claimed invention, except it does not disclose that there is a science instrument section onboard that probes radially into the borehole wall. Mount, II discloses a drill system in which there is an instrument package that probes laterally into a borehole and retains a sample. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the sampler of Mount, II with the apparatus of Scott et al. in view of De Smaele. This would be done because it is disclosed (col.5 lines 57-60) in Scott et al. that sampling of the earth is one of the purposes of the device and this would provide as an excellent sampler.

Allowable Subject Matter

10. Claims 2, 7-11 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

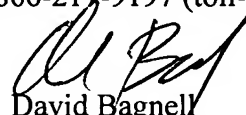
11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kling, Zollinger, Langner, Bohan, De Grassi, Braodway, Snyder, Ebeling, Gootee and Beaufort et al. all show similar elements to the present invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel P. Stephenson whose telephone number is (571) 272-7035. The examiner can normally be reached on 8:30 - 5:00 M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J. Bagnell can be reached on (571) 272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


David Bagnell
Supervisory Patent Examiner
Art Unit 3672

DPS 